

Notice of Allowability

Application No.

10/804,677

Examiner

Kagnew H Gebreyesus

Applicant(s)

CHENG ET AL.

Art Unit

1652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to the amendment filed on Jan. 11, 2005.
2. ☒ The allowed claim(s) is/are 6,14,16-18 and 20-26.
3. ☒ The drawings filed on 19 March 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 6/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Applicants traversal:

1. Applicant's argument regarding consideration of claims 23-26 has been acknowledged. Prior art USPAT 6,660,507 B2 teaches the use of *Methylomonase* sp. 16a ATCC PTA 2402 for the production of isoprenoid compounds however, upon further reconsideration, given the allowability of the product (SEQ ID NO: 18), the method of expression/production of said polypeptides encoded by SEQ ID 18 in *Methylomonase* sp. 16a ATCC PTA 2402 is also allowable in light of *In re Ochiai*, *In re Brouwer* and 35 U.S.C. § 103(b)," 1184 O.G. 86 (March 26, 1996).

Examiner's amendment:

Authorization for this examiner's amendment was given in a telephone interview with Dr. S. Neil Feltham on 01- 25- 05.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Cancel, claims 1-5, 7-13, 15, 19, 27-31.

Claim 6 is amended as follows:

Claim 6. "An isolated nucleic acid molecule as set forth in SEQ ID NO: 18, wherein said nucleic acid molecule encodes crtE, crtX, crtY, crtI, crtB and crtZ or comprising a polynucleotide having at least 95% identity to SEQ ID NO: 18 wherein said polynucleotides encodes the following

Art Unit: 1652

enzymes: Geranylgeranyl pyrophosphate synthase (crtE), phytoene synthase (crtB), phytoene desaturase (crtI), lycopene cyclase (crtY), beta-carotene hydroxylase (crtZ) and zeaxanthin glucosyl transferase (crtX).”

Claim 20 is amended as follows:

The “a” is deleted from (ii).

Claim 22:

Claim 22 is not in proper dependent form. It is amended to read as follows:

A method according to claim 21 wherein the C1 metabolizing host is a methanotroph and the fermentable carbon substrate is selected from the group consisting of methane, methanol, formaldehyde, formic acid, methylated amines, methylated thiols and carbon dioxide.

Claim 26 is amended as follows:

A method according to claim 20 wherein the carotenoid compound produced is selected from the group consisting of: beta-carotene, lycopene, phytoene, zeaxanthin and zeaxanthin glucosyl beta-diglucoside ”

Allowable Subject Matter

2. Claims 6, 14, 16, 17, 18, 20-26 are allowed with the proper amendments as above.

Art Unit: 1652

Accordingly, the following is an examiners statement of reason for allowance:

All claims are limited to an isolated nucleic acid molecule of SEQ ID NO: 18, comprising *crtE*, *crtX*, *crtY*, *crtI*, *crtB*, and *crtZ* or a nucleic acid molecule having 95% sequence identity to SEQ ID NO: 18 wherein the isolated polynucleotide molecule encodes all of the polypeptides *crtE*, *crtX*, *crtY*, *crtI*, *crtB*, and *crtZ* and method of expression/production of said polypeptides. The closest prior art having sequence and functional identity to the applicant's invention is by Kamiunten et al. (Isolation and characterization of carotenoids biosynthetic genes from *Pantoea agglomerans* with sequence accession number AB076662 which shows 66.5% best local similarity and only 32.2% identity to SEQ ID NO: 18. In addition deSouza et al. show a nucleic acid sequence with 65.3% best local similarity to SEQ ID NO: 18. Furthermore individual genes within the cluster of SEQ ID NO: 18 were searched to nucleic acid and encoded protein sequences in the database and no sequence with more than 60% identity was found. Therefor none of the references, nor the prior art in general, teach or suggest the specific nucleic acid molecule of SEQ ID NO: 18, comprising *crtE*, *crtX*, *crtY*, *crtI*, *crtB*, and *crtZ* or a nucleic acid molecule having 95% sequence identity to SEQ ID NO: 18.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kagnaw H Gebreyesus whose telephone number is 571-272-2937. The examiner can normally be reached on 8:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Achutamurthy ponnathapura can be reached on 571-272-0928. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1652

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kagnew Gebreyesus PhD.
Art Unit 1652


REBECCA E. PROUTY
PRIMARY EXAMINER
GROUP 1800
1610